भारतीय मानक
Indian Standard

IS 15381 : 2021

अग्नि शमन हेतु कंबल — विशिष्टि

(पहला पुनरीक्षण)

Fire Blanket — Specification

(First Revision)

ICS 13.340.10

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January 2021 **Price Group 4**

Fire Safety Sectional Committee, CED 36

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Fire Safety Sectional Committee had been approved by the Civil Engineering Division Council.

The fire blanket is intended for use as first aid in firefighting operations in home and industry for smothering and extinguishing fire in its early stages. The fire blanket may also be used in limited application in offices, shops, restaurants, hotels and hospitals. With this objective, first version of the standard, IS 15381 was formulated in 2003.

In this revision of the standard, following major changes have been incorporated:

a) Constructional aspects of blankets have been modified promoting use of appropriate materials capable of meeting the stipulated performance requirement of fire resistance.
b) Size of fire blanket has been updated to cover small sized and large sized fire blanket having respective usage/purpose.
c) New fire performance tests using both cooking oil and hydrocarbon oil have been included and illustrated.
d) New test towards electrical resistance of fire blanket has been included and illustrated.

In the formulation of this standard, assistance has been taken from:

EN 1869: 1997	Fire blankets

The Indian Standards, IS 16874 : 2018 ‘Specification on Textiles — Protective gloves for firefighters’; and IS 16890 : 2018 ‘Textiles — Protective clothing for firefighters’ may also be referred for respective applications.

The composition of the Committee responsible for the formulation of this standard is given in Annex E.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of specified value in this standard.

Indian Standard

FIRE BLANKET — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard specifies requirements for fire blankets which are not re-useable. It is applicable as first aid for small fires in home and industry.

1.2 The standard covers fire blankets of dimension at least 0.9 m and up to 1.8 m.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1248 (Part 6) : 2003	Direct acting indicating analogue electrical measuring instruments and their accessories: Part 6 Ohmmeters (Impedance meters) and conductance meters (*third revision*)
7639 : 1975	Methods of sampling of asbestos cement products
15758 (Part 4) : 2020/ ISO 15025 : 2016	Textiles — Protective clothing: Part 4 Method of text for limited flame spread (*first revision*)

3 MATERIALS

The blanket shall be made from refractory materials, such as fibre glass, silicon fibre and ceramics, that are being progressively used. Asbestos shall not be used in the manufacture. The blanket material shall be such that it does not cause/induce itching to the human body.

4 CONSTRUCTION

4.1 A fire blanket shall be formed of one sheet of material, or two sheets of material each of a size of equal to the overall size of the fire blanket, which are stitched together. The two sides shall be similar in performance.

There shall be no seams in the fire blanket, except as given below, if required:

a) where the hand-holding devices are fixed; and
b) at any edge.

4.2 Hand holding devices shall not comprise loops, they shall not be flammable, and shall not become detachable from the fire blanket during any of the testing specified in this standard, after subjected to conditioning requirements as in Annex A.

4.3 Fire blankets shall be rectangular or square and no edge shall be less than 0.9 m or more than 1.8 m.

4.4 The total mass of fire blanket shall not exceed 4.5 kg.

4.5 Fire blankets shall be capable of being rolled completely around a 50 ± 2 mm diameter bar, along any axes parallel to adjacent sides, without permanent deformation.

4.6 When stowed or packed in accordance with manufacturer's instructions, it shall be possible for a fire blanket to be taken from the stowed position, unfolded and held ready for use in not more than 10 s. The force required to remove the fire blanket shall not exceed 80 N.

4.7 The edges of the fire blanket shall not fray or tear during any of the tests given in this standard.

5 ELECTRICAL RESISTANCE

The electrical resistance of the blanket fabric is measured as described in Annex B between a negative electrode formed by a metal table top and positive electrode formed by a flat rectangular conducting plate. When tested in accordance with Annex B, the electrical resistance of the blanket shall not be less than 1 MΩ at any point.

6 FIRE PERFORMANCE

6.1 When tested in accordance with Annexes C and D, the fire blanket shall be capable of extinguishing the cooking oil and hydrocarbon fuel as described therein.

6.2 The fire blanket shall remain whole (intact and unbroken) and not ignite during the test.

6.3 The fire blanket should withstand a temperature of 850 °C to 900 °C for 2 min, when tested as per **9.1.2** of IS 15758 (Part 4).

7 WORKMANSHIP AND FINISH

The blanket shall be reasonably free from spinning, weaving and stitching defects and effect in workmanship consistent with good manufacturing practice.

8 SAMPLING

The sampling, inspection and acceptance shall be in accordance with IS 7639.

9 MARKING

9.1 Each blanket shall be legibly and indelibly marked with the manufacturer's/supplier's name and address.

9.2 The container shall be marked with the following information and fixed such that the following is visible:

a) Nomenclature and size,
b) Model No.,
c) Batch No.,
d) Manufacture's name,
e) Year of manufacture,
f) The instruction 'DISCARD BLANKET AFTER USE', and
g) Operational instruction through pictograms and an instruction to '*COVER THE BURNING MATERIAL COMPLETELY*', '*SWITCH OFF HEAT*' and '*LEAVE COVERED UNTIL COOL*'.

9.3 BIS Certification Marking

The fire blanket conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the fire blanket may be marked with the Standard Mark.

ANNEX A

(*Clause* 4.2)

TEST REQUIREMENTS

A-1 Except where otherwise specified, tests shall be carried out at a temperature of 27 ± 5 °C.

A-2 All tests shall be carried out using a single thickness of the fire blanket. Each fire blanket shall be tested separately.

A-3 A minimum of three fire blankets shall be tested. Identify and mark the blankets as 1 to 3 and the two sides as ‘a’ or ‘b’. Two of the blankets shall be tested on side ‘a’ and one on side ‘b’.

A-4 The fire blanket shall be conditioned in air at 27 ± 5 °C, at a relative humidity of 65 ± 10 percent for 48 h before testing. After this period of time, the fire blanket shall not be exposed to a different atmosphere for more than 5 min.

A-5 The fire blankets shall be stored for testing in their containers or stowage position for a minimum of 24 h immediately prior to testing.

ANNEX B

(*Clause* 5)

ELECTRICAL RESISTANCE TEST

B-1 APPARATUS

B-1.1 Table, with metal top to be negative electrode.

B-1.2 Megohmmeter, 500 V d.c. [See IS 1248 (Part 6)].

B-1.3 Flat conducting rectangular plate, 450 mm × 150 mm incorporating an insulated handle and having a total mass of 5.0 ± 0.25 kg.

NOTE — A steel plate will be adequate.

B-2 SAMPLE

Fresh sample duly conditioned shall be tested.

B-3 PROCEDURE

Arrange the apparatus as shown in Fig. 1. Lay the blanket flat on the table and measure its electrical resistance using the megohmmeter in accordance with the manufacturer’s instruction. Move the electrode and blanket as necessary to test the whole of the blanket.

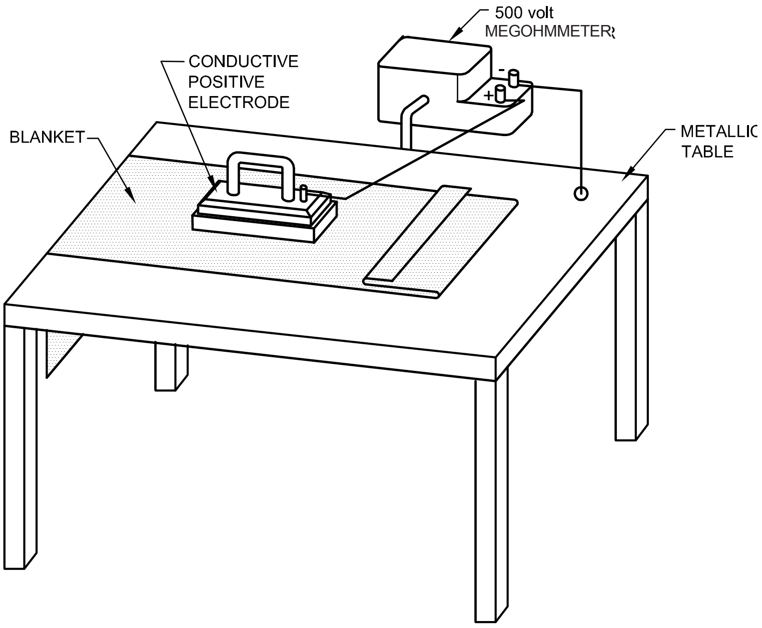

Fig. 1 Electrical Resistance Test Rig

ANNEX C

(*Clause* 6.1)

FIRE PERFORMANCE TEST USING COOKING OIL

C-1 MATERIALS AND APPARATUS

C-1.1 Fuel

The fuel shall be an edible cooking oil, free, from additives, with an auto-ignition temperature in the range of 350 °C to 370 °C. Three litres of fresh fuel shall be used for each test.

C-1.2 Fuel Tray

Tray having internal diameter 345 ± 5 mm and depth 100 ± 5 mm, and free from residue from previous tests.

C-1.3 Tray Support Stand

The tray support stand dimensions shall be as given below:

Material : 25 × 25 mm, L section
Height : 140 ± 5 mm
Length : 240 ± 5 mm
Width : 240 ± 5 mm

C-2 SAMPLE

Fresh sample to be used.

C-3 PROCEDURE

C-3.1 Place the test tray centrally on the tray support stand.

C-3.2 The fire performance test shall be conducted in a room free from draughts, and with sufficient ventilation to allow the fire to develop freely and to remove products of combustion. The ambient temperature shall be between 0 °C and 30 °C.

C-3.3 Place the fuel in the tray and, using a gas burner centrally positioned under the tray, heat the oil so that its temperature, measured centrally, increases at about 10 °C/min and self-ignites within 25 min to 30 min. Turn off the gas supply. Allow the fire to burn freely for 2 min after ignition, and then position the fire blanket fully opened over the tray, so that the centre point of the fire blanket is close to the centre of the tray. Adjust the position of blanket if it seems necessary.

C-3.4 Remove the blanket 17 min after ignition and observe whether the fire is extinguished. The fire is considered to be extinguished, if there are,

a) no visible flames after removal of the blanket; and
b) no re-ignition within 3 min of removal of the blanket.

Some fuel shall remain at the end of the test, that is, the fire shall be extinguished and not merely starved of fuel.

ANNEX D

(*Clause* 6.1)

FIRE PERFORMANCE TEST USING HYDROCARBON FUEL

D-1 MATERIALS AND APPARATUS

D-1.1 Fuel

The fuel shall be an aliphatic hydrocarbon of initial boiling point not less than 88 °C and final boiling point not more than 105 °C. Three litres of fresh fuel shall be used for each test.

D-1.2 Fuel Tray

Tray having internal diameter 345 ± 5 mm and depth 100 ± 5 mm, and free from residue from previous tests.

D-1.3 Tray Support Stand

The tray support stand dimensions shall be as given below:

Material : 25 × 25 mm, L section
Height : 140 ± 5 mm
Length : 240 ± 5 mm
Width : 240 ± 5 mm

D-2 SAMPLE

Fresh sample duly conditioned shall be tested.

D-3 PROCEDURE

D-3.1 Place the test tray centrally on the tray support stand.

D-3.2 The fire performance test shall be conducted in a room free from draughts, and with sufficient ventilation to allow the fire to develop freely and to remove products of combustion. The ambient temperature shall be between 0 °C and 30 °C.

D-3.3 Place in tray, sufficient water (half the fuel volume) to give an average depth of 15 mm. This is to counter any irregularities in the base. Place the fuel in the tray. After ignition, allow the fire to burn freely for 1 min, then apply the fire blanket under test as symmetrically as possible.

D-3.4 The fire is considered to be extinguished if no flames are visible 3 min after ignition. Some fuel shall remain at the end of the test, that is, the fire shall be extinguished and not merely starved of fuel.

ANNEX E

(*Foreword*)

COMMITTEE COMPOSITION

Fire Safety Sectional Committee, CED 36

Organization	*Representative(s)*
In Personal Capacity (*K-33A, Green Park, New Delhi*)	Shri S. K. Dheri (***Chairman***)
Advance Firetec and Research Lab Pvt Ltd, New Delhi	Shri S. K. Nandi Shrimati Indu Sharma (*Alternate*)
Bhabha Atomic Research Centre, Mumbai	Shri A. K. Tandle
CSIR- Central Building Research Institute, Roorkee	Dr Suvir Singh Shri A. A. Ansari (*Alternate*)
Central Industrial Security Force, New Delhi	Shri Rajnath Singh Shri A. K. Verma (*Alternate*)
Central Public Works Department, New Delhi	Shri Chaitanya Kumar Verma Shri Sham Sunder Garg (*Alternate*)
Centre for Fire Explosive & Environment Safety (CFEES), Delhi	Dr K. C. Wadhwa
Chennai Petroleum Corporation Limited, Chennai	Shri J. P. K. Hepat
City and Industrial Development Corporation, Navi Mumbai	Shri Arvind Mandke
Delhi Fire Services, New Delhi	Director Chief Fire Officer (*Alternate*)
Delhi Metro Rail Corporation Limited, New Delhi	Shrimati Papiya Sarkar Shrimati Rashmi Bhardwaj (*Alternate*)
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Directorate of Fire & Emergency Services, Panaji	Director
Engineers India Limited, New Delhi	Shri Naresh Kaul Shri R. B. Bhutda (*Alternate*)
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Fire Safe India Foundation, Mumbai	Shri Milindkumar Deshmukh
FM Engineering International Limited, Bengaluru	Shri Srikanth Yajjala Shri Manikandan Krishnamoorthy (*Alternate*)
Fyrprotek (Fire Engineers & Consultants), New Delhi	Shri Gulshan Khurana
GAIL (India) Limited, New Delhi	Shri D. P. Nanda Shri R. P. Singh (*Alternate*)
Hilti India Private Limited, Gurugram	Shri Brij Bhusan Singh Shri Aravind Chakravarty V(*Alternate*)
Indian Association of Structural Engineers, New Delhi	Shri S. C. Mehrotra Shri Sitaram Aggarwal (*Alternate*)
Indian Institute of Technology Roorkee, Roorkee	Prof Vishal Kumar Prof Umesh Kumar Sharma (*Alternate*)

Organization	*Representative(s)*
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Institution of Fire Engineers (India), New Delhi	President General Secretary (*Alternate*)
J & K Fire and Emergency Services, Srinagar	Shri V. K. Singh Shri Bashir Ahmed Shah (*Alternate*)
Johnson Controls (I) Pvt Ltd, Gurugram	Shri Santosh Muzumdar Shri Nitin Rastogi (*Alternate*)
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Lloyd Insulations (India) Limited, New Delhi	Shri K. K. Mitra Shri Sanjeev Angra (*Alternate*)
Maharashtra Fire Services, Mumbai	Director Joint Chief Fire Officer (*Alternate*)
Ministry of Home Affairs, New Delhi	Shri D. K. Shami Deputy Fire Adviser (*Alternate*)
Military Engineer Services (E-in-C's Branch), New Delhi	Shri Sanjay Agarwal
Mumbai Fire Brigade, Mumbai	Chief Fire Officer Deputy Chief Fire Officer (*Alternate*)
NTPC Ltd, Noida	Shri Santosh Kumar Jha Shri Doondeshwar V (*Alternate*)
National Association of Fire Officers (NAFO), Mumbai	Representative
Nohmi Bosai (India) Pvt Ltd, Gurgaon	Shri Ajit Raghavan
Pacific Fire Controls, Delhi	Shri Rakesh Kumar Arora Shri Daksh Arora (*Alternate*)
Proion Consultants, New Delhi	Shri Sandeep Goel
Reliance Refineries Limited, Jamnagar	Shri Varadendra Koti Shri Umesh Khandalkar (*Alternate*)
State Bank of India, Mumbai	Shri Vinayak Gokhale Fire Officer (*Alternate*)
Tamil Nadu Fire and Rescue Services Department, Chennai	Shri M. Shahul Hameed Shrimati Meenakshi Vijayakumar (*Alternate*)
Techno Fire Protection Services Pvt Ltd, Pune	Shri D. G. Koimattur
The Automotive Research Association of India, Pune	Shri Charudatta S. Mukhedkar Shri R. D. Chaudhari (*Alternate*)
The Indian Institute of Architects, Mumbai	Ar Vijay Garg
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In personal capacity (*A-45, Sector-70, Noida*)	Dr H. S. Kaprwan
In personal capacity (*27A, Tapovan Senior Citizens Foundation, Coimbatore 641 010*)	Shri T. R. A. Krishnan
BIS Directorate General	Shri Sanjay Pant, Scientist 'F' and Head (Civil Engineering) [Representing Director General (*Ex-officio*)]

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Shri Arun Kumar S.
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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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